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Provide for more use of technology to create personalized, competency-based learning environments and delivery methods that allow students to demonstrate mastery of content at their own pace.

## What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

More schools and colleges are seeking new and innovative learning models to provide students with greater engagement, flexibility and control of their learning experience. Some have linked new technology applications to older learning models to create breakthrough innovations:

- **In competency-based education, students move through a course at their own pace as they master pre-determined competencies. Course length is not defined by a calendar and is not measured by Carnegie units. Technology tools provide timely assessment to students on where they stand on competencies and what they need to complete.**
- **Adaptive learning is based on learning that is sequenced by technology tools. These tools recognize when students have or have not met competencies and present learning materials accordingly — stressing unlearned concepts as needed and moving ahead as appropriate. It incorporates mastery learning because the student does not move forward until s/he has mastered the concepts, leaving no gaps in knowledge.**
- **Personalized learning is a student-centric model that provides more student choice for evidence of learning, often incorporating adaptive, mastery, and competency-based learning.**

While high school graduation rates have improved nationwide, national assessments of college readiness show that far too many graduates are not ready for college and careers. Education leaders have focused on new learning models for high schools that build competencies and skill sets for college and career readiness by focusing on deeper, more engaging learning. Teaching to a classroom of students and focusing on the elusive “average” student is no longer effective. With modern teaching tools — computer diagnostic exams, formative assessments, and adaptive content to meet individual students’ needs — teachers can foster more individualized approaches to teaching that can result in deeper learning and better student engagement. Engaged students are more likely to persist in educational tasks until they reach their goal.

College faculty are serious about exploring new models. Examples include prior learning assessment, self-paced learning, module-based delivery, flipped classrooms, game-based learning, use of artificial intelligence for tutoring, virtual reality, augmented reality and mixed reality. Formats designed to allow students more control over pacing, learning style and how they express their learning could provide them with affordable options that honor their prior learning as well as adapt to their specific needs. These formats focus on outcomes rather than time spent in the classroom.

Barriers to implementation, such as policies, regulations, and accreditation guidelines, need to be matched to the promise of these innovations. As with all academic programs, these new learning models must prove themselves with evidence-based research and be developed with appropriate rigor and quality. They will likely undergo continuous cycles of improvement as they mature to meet the high educational demands of the future, as well as student and employer expectations. But waiting for significant studies to determine the effectiveness of new models should not hinder institutions from experimenting, so long as they monitor effectiveness and report results.

The goal for new learning models is to increase retention among traditional students and facilitate college completion for the non-traditional students who have some college but no degree. Without new learning models, a college degree will remain unattainable for the 29 million Americans

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qualified to enter college, but for whom family, work and socio-economic circumstances preclude completion of a traditional program. For K-12 education, these models can be the difference between a high school dropout and a student well-prepared for college or career.

# Student Digital Literacy



Ensure students have the fundamental skill sets they need from the early grades through college to be fully engaged in technology-mediated learning opportunities to develop lifelong fluencies for success in a digital world.

## What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

Literacy means not only the ability to read and write, but also to be fluent in a world of digital information. Digitally literate citizens have the knowledge and skills to access, evaluate, manipulate, utilize, design and develop information — and ultimately to learn from the digital environment. While educators have known for some time that students needed these skills, it is only recently that state agencies have recognized their responsibility to ensure that students at all levels learn to comprehend and communicate digital information at varying levels throughout their education. This responsibility means laying the groundwork for digital literacy in the very early grades.

Digital literacy skills are critical for an informed and productive citizenry, as a gateway to social, political, educational and economic participation. Digital literacy belongs beside reading, writing and math as a fundamental skill in the modern world.

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Schools need to adopt a digital literacy curriculum beginning in the elementary grades to ensure that students develop the necessary skills in a stepwise, systematic way.

A 2016 Stanford University study of nearly 8,000 secondary school and college students

in 12 states makes clear that these skills are unlikely to develop on their own. It shows that most students cannot distinguish between an advertisement and a news article or determine the source of the information. Eighty percent of middle graders thought an ad marked as “sponsored content” was a legitimate news article. High school students couldn’t discern between fake news accounts and actual news sources on social media. College students were not able to evaluate the credibility of a website or wade through contradictory results of a Google search to find reliable and accurate information.

Yet, more and more, employers require digital literacy as an employment skill, and the Pew Research Center recognizes it as

one of the foundational tools of life-long learning and success. Digital literacy is often correlated with career achievement and productivity. The future competitiveness of American companies in the knowledge-based global economy could well depend upon the digital fluency of our workforce. Research shows that a lack of digital literacy skills contributes to a “digital divide.” People with lower incomes, the elderly, the less-educated, the unemployed, and people with disabilities have less access to digital communications — and therefore less opportunity to build skills related to the technology. Many of these people are already marginalized; their digital illiteracy only adds to their isolation because they are unable to access support networks, government services, political processes, or economic opportunities.

Digital literacy competencies must become an everyday part of the learning experience of school children; these skills should be integrated into instruction at all levels. Organizations such as P21.org and [ISTE](#) (International Society for Technology in Education) have undertaken significant work. The P21 framework for 21st century learning provides information and media on the topic and it has laid out technology literacy skills. ISTE has developed student standards that incorporate digital literacy to help students thrive in an ever-evolving technological world. Each of ISTE’s seven standards (empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and global collaborator) include four indicators used in measuring achievement of the standards. P21 and ISTE have laid the groundwork for students’ incremental digital literacy skills. States should adopt PK-20 digital literacy standards and incorporate the required skills into the curriculum so that students graduate with the digital skills they need to enter the workforce.

For postsecondary education, the Association for College and Research Libraries ([ACRL](#), a division of the American Library Association) has developed a framework for information literacy in higher education. ACRL has also developed a free information literacy [toolkit](#) to help individuals and groups understand and implement the framework. Marshall University librarians have designed an original literacy assessment based on the ACRL rubric and [Degree Qualifications Profile](#) from the Lumina Pathways project, with specific skill sets for associate, bachelor’s and graduate degrees.

# Technology Security



Provide adequate resources to protect information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction while keeping them highly available for student learning and education administration.

## What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

Technology security is a global issue for education, government, military, business and private individuals. Today all technology systems, from learning management systems to institutional networks, access points, wi-fi networks, enterprise resource planning, and student information systems, need technology security extending from the user level to the network, institution and beyond, including vendor partners. More schools and institutions now use third-party vendor networks, cloud-based services and online educational tools than ever before, which makes them vulnerable to external access. If they have multiple devices and sensors (known as the Internet of Things or IOT) connected to their network, they create additional risk of unauthorized network access. More than 72 percent of IOT devices are hackable and expose risks for unauthorized access to larger systems.

Security risks from breaches of network or individual systems, whether from hacking, malware, ransomware, third-party system vulnerabilities or mistakes by employees, have heightened public concern over the safety of their personal information. Malicious emails, generally disguised as trustworthy — known as Phishing attacks — have increased exponentially. Hackers use such attacks to obtain login credentials and access to technology systems, and hold systems and data for ransom for untraceable bitcoin.

State agencies, schools and colleges should create multiple layers of security to ensure that technology equipment, software, and security services are up-to-date and available at all times. They should provide user education to their constituents and update it regularly. If states fail to support strong policies on technology security, or to provide adequate training and sustainable funding, students and staff will eventually suffer the loss or corruption of private information and institutions will lose operational information and services, in addition to the related costs of identity theft protection and lawsuits.

One SREB state recommends the following practices to ensure technology security:

- **Do the Basics** – To reduce number of incidences and exposure, promote awareness of basic, but extremely important, security

and privacy policies. Use strong passwords and change them often. Keep a password, PIN or passcode on all devices. Whenever staff depart, change security entry codes and locks for buildings or rooms containing sensitive information. Remove old or unused user accounts from all systems and keep up with employee training and communications.

- **Keep Accurate and Updated Data Inventories** – Inventory all records systems (e.g., electronic and paper storage media) to identify those containing personal information. This will help determine what level of protection is necessary for each system, and what priority it has. Classify information in each paper and electronic records system according to sensitivity and the organizational risk if that information was accidentally or intentionally accessed by anyone without a need to know. A rule of thumb to identify sensitivity and confidentiality in an organization would be to reflect on whether the data could be posted on a public website or viewed by anyone making an open records request.
- **Have a Healthy Data Diet** – Collect the minimum amount of personal information necessary to accomplish the educational purposes and retain it for the minimum time necessary.
- **Intruder Detection** – Use appropriate physical and technological safeguards, such as video surveillance or alarms, to protect personal information, particularly higher-risk information, in paper and electronic records.
- **Vendor Management** – Require service providers and partners who handle personal information on behalf of the organization to follow the institution's security policies and procedures as well as state and federal laws (such as COPPA, FERPA). Develop security protocols for inclusion in contracts.
- **Encryption** – For devices used to host or access high-risk information, use data encryption in combination with host protection and access control. Pay particular attention to protecting high-risk personal information on laptops and mobile storage devices (e.g., tablets, smartphones, CDs, thumb drives).
- **Records Retention** – Dispose of records and equipment containing protected information in a secure manner.
- **Document Your Security** – Document security plans and revise annually or whenever there is a material change in practices for data delivery, storage and access.



# Digital Accessibility



Make digital content and sites accessible to students with disabilities, in compliance with the Americans with Disabilities Act and other regulatory requirements, through design, professional training and instructional practices.

## What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

Accessibility of digital content and websites is now a critical issue in education technology because online and blended programs in secondary and postsecondary classrooms have proliferated, and digital content has grown substantially. Students with visual, auditory, motor, or cognitive impairments have the right to access this digital content and online instruction in an equally effective way as students without disabilities. Yet, schools and colleges often have not made digital content and online instruction as accessible to these students as is required by law.

According to the U.S. Department of Education, 13 percent of public school students and 11 percent of postsecondary students have disabilities. These students often need assistive technologies, such as screen readers, braille, speech-to-text or navigation devices to access digital content — all of which are readily available. Federal and state laws require equal opportunity and equal access for everyone, regardless of disability. Section 504 and 508 of the Rehabilitation Act of 1973 and Title II and Title III of the Americans with Disabilities Act of 1990 regulate institutions and schools. Some states have their own laws as well. Most recently, the Every Student Succeeds Act and amendments to the Higher Education Opportunity Act have addressed the need for accessible content. They also stress the benefits of building accessibility into the design of instructional materials so they are functional for everyone, using a principle known as “universal design for learning.” In January 2017, the federal government adopted WCAG 2.0 Level AA as the official standard for Section 508 of the ADA, and federal agencies must comply with the standard by January 2018. This standard for accessibility was developed by the World Wide Web Consortium (W3C) and is accepted internationally.

Often faculty members create online course components without accounting for students with disabilities. When they are notified they have a student with a disability enrolled in a class, they have to make last-minute modifications to course content, and their students are often short-changed with less-than-standard accommodations. Federal policy and guidance

directs educational leaders to address digital accessibility at every opportunity, but too many institutions do not make their digital content and websites accessible. When they deny students with disabilities equal access under the law, they risk law suits from the Department of Justice or the Department of Education, Office of Civil Rights. Students, disability organizations (such as the National Federation for the Blind), and individual citizens can file complaints and the responsible federal agencies are required to investigate.

While federal laws clearly indicate that educational entities are responsible for the accessibility of the materials they purchase, many publishers and other vendors have not produced fully supportive accessible materials. Faculty who are not alert often purchase inappropriate materials for use online, without regard to applicable accessibility laws. To overcome this shortcoming, SREB states need accessibility training, legal compliance awareness, improved communication, clarification on purchasing policy, and vendor and technology support.

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Educational agencies, schools and institutions need to have a comprehensive accessibility plan. These plans should include acceptable practices, a communication plan, training, and an evaluation process to ensure that policies are followed. Agencies should use purchasing contract

language that requires a voluntary product accessibility statement (VPAT) and that addresses the consequences for the vendor if materials and services purchased are not accessible. Accessible content and universal design for learning benefit not just disabled students but all learners, especially English language learners and students with different learning styles or learning disabilities. Accessible content is both a legal and an ethical obligation.

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Maintain regular state-level review of technology-related legislation and policies on education standards, access and infrastructure to ensure that these policies are adequate, necessary, aligned and integrated.

### What is the issue and why is it important? What if SREB states do not make adequate progress on this issue?

Maintaining a sound policy framework for education technology means ensuring that it supports relevant standards, strong accountability systems, equitable access to education, and practices that allow students to make continuous educational progress. It is also critical to align these policies with state and federal laws and regulations, and with system-wide or district-wide policies. When local or state policies are not aligned with federal guidelines, schools and districts inevitably become confused, make mistakes, and repeat work unnecessarily — or leave work undone. These errors exacerbate the strain on schools and agencies that are already understaffed and underfunded.

*Well-meaning but unnecessary policies can, and often do, present barriers to innovative learning models and emerging technology tools.*

Educational technologies change quickly, and policies on technology infrastructure and data systems must be flexible enough to incorporate new tools and practices — yet secure enough to ensure the privacy of the data they contain.

Well-meaning but unnecessary policies can, and often do, present barriers to innovative learning models and emerging technology tools.

For example, competency-based education, and personalized, adaptive, and self-paced learning models in general, are often inhibited by policies that award credit based on time spent in a course (referred to as “seat-time”) rather than mastery of course content. They are also thwarted by financial aid models that count the number of academic terms by the calendar (and pay accordingly) rather than by the completion of modules. As technology systems and various digital tools provide other ways to account for academic progress, the related policies need to be flexible enough to support these innovations. Education reform and policy change must go hand in hand.

Schools and colleges generate more data than they can readily use, and they need policies that protect students’ security and privacy. However, restrictive policies about what information to collect, how to collect and use and transmit it, and how long to keep it can inhibit policy analysis. Researchers need access to rich data sets to conduct longitudinal studies of success and of equitable access. These data need to be linked from K-12 to higher education so that researchers can study the long-term effectiveness of technology innovations and of new digital learning models in promoting deeper learning.

Policies are only as good as their implementation. Both the University of California System and the University of California at Berkeley had strong policies on how faculty and staff were to implement their online courses so that these courses would be fully accessible for students with disabilities. But having adequate, aligned policies on digital accessibility was not enough. The university did not have an enforcement mechanism, and few faculty followed the policy. Potential students who could not access the university’s online courses filed lawsuits and engaged the university in drawn-out negotiations. State and local agencies need policies that are more than suggestions. They need to enforce them if they expect them to be effective.

Higher education institutions in SREB states that are engaged in distance learning have an opportunity to align themselves with a strong new regional and nationwide policy on distance education. A section of the 2010 revision to the Higher Education Opportunity Act focuses on the quality and integrity of distance learning programs. Several organizations, including SREB, worked toward informed, collaborative policies that would align with the Act. Currently, the four regional compacts — Southern Regional Education Board, New England Board of Higher Education, Midwestern Higher Education Commission, and Western Interstate Cooperative for Higher Education — work with a national council to oversee distance education authorization and nationwide quality standards. This collaboration provides strong policy to promote quality, reciprocity and alignment — with accountability to both students and institutions.

# 10 Issues in Educational Technology Related Briefs

Data Privacy and Security

Expanding Accessibility to Digital Spaces Through Improved Policy and Practice

Emerging Technologies and New Learning Models That Engage Students

*Coming Soon*

Student Digital Literacy and Bandwidth

Educational Data Systems and Predictive Analytics





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